

REMARKS

The Examiner is thanked for the performance of a thorough search.

By this amendment, no claims have been amended or added. Claims 24-48 and 72-96, which were previously withdrawn, or cancelled herein. Hence, Claims 1-23 and 49-71 are pending in the application.

PREVIOUSLY SUBMITTED IDSs HAVE NOT BEEN ACKNOWLEDGED

The Applicants submitted two different Information Disclosure Statements (individually an "IDS") on December 28, 2004, an IDS on September 21, 2004, and an IDS on July 13, 2004 (collectively "the unacknowledged IDSs"). However, the Applicants have not yet received an initialed PTO Form-1449 acknowledging the receipt and consideration of the unacknowledged IDSs. Consequently, the Applicants respectfully request receipt of an initialed PTO Form-1449 acknowledging the receipt and consideration of the unacknowledged IDSs.

THE SPECIFICATION CORRECTLY INCORPORATES SUBJECT MATTER BY REFERENCE

The specification was objected to for failing to identify the application number and filing date of a patent application incorporated by reference. The Applicants respectfully submit that each patent application incorporated by reference was accurately identified in the Applicants' patent application as originally filed. For example, the patent application objected to by the Office Action was identified in the Applicants' specification by title and attorney docket number. However, the Applicants filed a preliminary amendment on April 10, 2002 that correctly recited both the application number and the filing date of the identified patent

application incorporated by reference. Consequently, it is respectfully submitted that the objection to the Applicants' specification has been overcome.

INTERVIEW SUMMARY

The Applicants thank the Examiner for the Interview conducted on March 30, 2005. The interview was between Examiner Dodds and the Applicants' Attorney, Christopher J. Brokaw. The following topics were discussed: (a) the background of the Applicants' patent application, (b) the approach of Claim 1, (c) the approach of the *Traversat* reference and the approach of the *Sheard* reference, and (d) how Claim 1 recites features not disclosed, taught, or suggested by the cited art.

The Examiner indicated that Claim 1 and the corresponding computer-readable medium claim would be allowable over the art of record if amended to recite the features of dependent Claim 2 and dependent Claim 49 respectively. The Examiner further clarified the rejection of Claim 1 by stating that (a) *Traversat* teaches the use of caches at Col. 12, lines 12, (b) *Sheard* teaches the use of a master as featured in Claim 1 by the teaching of an owner process, e.g., in Col. 68, lines, lines 48-52. No agreement was reached in the Interview.

THE REJECTIONS/OBJECTIONS TO THE CLAIMS

Claims 2-5, 12, 50-53, and 60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Claims 1, 10, 18, 20-23, 49, 58, 66, and 68-71 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,115,715 issued to Traversat et al. ("*Traversat*") in view of U.S. Patent Number 6,453,356 issued to Sheard et al. ("*Sheard*"). Claims 6-9 and 54-57 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of

Sheard in view of U.S. Patent Number 5,659,682 issued to Devarakonda et al. (“*Devarakonda*”). Claims 13 and 61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of *Sheard* in view of *Devarakonda* in view of U.S. Patent Number 6,032,188 issued to Maris et al. (“*Maris*”) in view of U.S. Patent Number 6,243,814 issued to Matena et al. (“*Matena*”). Claims 6-9 and 54-57 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of *Sheard* in view of *Devarakonda*. Claims 14, 16, 62, and 64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of *Sheard* in view of *Devarakonda* in view of *Maris*. Claims 15 and 63 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of *Sheard* in view of *Devarakonda* in view of *Maris* in view of U.S. Patent Number 6,012,085 issued to Yohe et al. (“*Yohe*”). Claims 17 and 65 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of *Sheard* in view of *Devarakonda* in view of *Maris* in view of U.S. Patent Number 5,933,849 issued to Srblic et al. (“*Srblic*”). Claims 11 and 59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of *Sheard* in view of U.S. Patent Number 5,999,940 issued to Ranger et al. (“*Ranger*”). Claims 19 and 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Traverset* in view of *Sheard* in view of U.S. Patent Number 6,832,120 issued to Frank et al. (“*Frank*”).

Applicants respectfully traverse.

CLAIMS 1-23 AND 49-71 ARE PATENTABLE OVER THE CITED ART

As explained in detail below, even if the cited art were to be properly combined, the resulting combination would not disclose, teach, or suggest at least one element in each pending claim, due to the significant, fundamental differences between the approach of the

pending claims and the approach of the nine cited art references, and in particular, the approaches of *Traversat* and *Sheard*.

The features of Claim 1

Claim 1 recites the following features:

“A method for managing caches in a system with multiple caches that may contain different copies of a data item, comprising the steps of:
modifying the data item in a first node of said multiple caches to create a modified data item;
sending the modified data item from said first node to a second node of said multiple caches without durably storing the modified data item from said first node to persistent storage;
after said modified data item has been sent from said first node to said second node, said first node sending a request to a master of said data item for writing said data item to persistent storage; and
in response to said request, said master coordinating with said multiple caches to cause said data item to be written to persistent storage”

The above-combination of elements is not disclosed, taught, or suggested, either individually or in combination, by *Traversat* or *Sheard*.

The Applicants’ specification describes various techniques for coordinating the writing of dirty data items to persistent storage in systems that allow a dirty version of the same data item to reside in multiple caches. For example, Claim 1 is directed towards a method for managing caches in a system with multiple caches. The system of multiple caches may contain different copies of a data item in the multiple caches. Initially, a data item, in a first node of the multiple caches, is modified to create a modified data item. Next, the modified data item is sent from the first node to a second node of the multiple caches without durably storing the modified data item from the first node to persistent storage.

After the modified data item has been sent from the first node to the second node, the first node sends a request, to a master of the data item, for writing the data item to persistent storage. In response to the request, the master coordinates with the multiple caches to cause the

data item to be written to persistent storage. For example, the master may (1) grant the first node permission to perform the write, or (2) inform the first node that another node has already written to persistent storage a version that is at least as recent as the dirty version stored in the requesting node.

Advantageously, the approach of Claim 1 allows dirty data items to be transferred between caches without first writing the dirty data item to persistent storage.

The teachings of the cited art

While the approach of the pending claims is directed towards transferring dirty data items between caches without first writing the dirty data items to persistent storage, the approaches of the cited art references are directed towards sharply different subject matter. As a result, fundamental differences exist between the subject matter of the cited art references and the approach of the pending claims.

For example, *Traversat* describes an approach for updating and managing a configuration database used to store configuration and user data for a plurality of clients. Configuration information, for each of the plurality of clients, is stored at a central server schema at a server. The configuration information for a particular client is stored in an appropriate location (or node) in a tree of nodes maintained by the server. To facilitate atomicity of transactions and the locking of nodes of the tree of nodes, when a transaction is performed against the configuration database, a determination is made as to whether the transaction is inserting a new node into the tree of nodes or modifying an existing node. A locking mechanism obtains a lock on a node according to whether a new node is being added to the configuration database or an existing node is being modified. After the transaction is performed, the locking mechanism then commits the transaction by releasing the lock if the

modification or insertion is successful, or aborts the transaction if the modification or insertion fails. (See Abstract; Col. 3, line 44 – Col 4, line 54; FIG. 2).

Importantly, there are numerous fundamental differences between the approach of *Traversat* and that of Claim 1. *Traversat* does not contain any suggestion of transferring dirty data items from one cache to another. Significantly, the approach of *Traversat* does not even contain a hint or suggestion of a system of multiple caches. Instead, *Traversat* teaches away from a system in which data is stored in more than one location by describing an approach for storing data in a central location in a tree of nodes at a server.

In fact, the *Traversat* reference contains only one recitation of the word “cache” (at Col. 12, line 12). However, this portion of *Traversat* merely states that the general purpose computer of FIG. 9 “can also very rapidly retrieve and store frequently needed data in a cache memory 910.” The Applicants concede that some general-purpose computers contained caches prior to the invention of the Applicants’ invention. However, while caches were known to those in the art, the use of caches presented certain problems. Claim 1 solves those problems by defining a technique that, *inter alia*, allows dirty data items to be transferred to one cache to another without first persistently storing the dirty data items.

The *Sheard* reference also has nothing to do with transferring data from one cache to another. Instead, *Sheard* is directed towards an approach for exchanging data between two or more applications. A technology dependent data stream, originating from a source application, is transformed into a technology independent stream using an adapter. A data exchange engine receives the technology independent stream and identifies a destination application. The technology independent stream is then transformed into a technology dependent stream, associated with the destination application, using a different adapter.

Sheard is relied upon by the Office Action to show a master of a data item stored in a cache, where the master receives a request from a first cache to write the data item to persistent storage, and the master coordinates with multiple caches to cause the data item to be written to persistent storage. Such a master is not disclosed, taught, or suggested by *Sheard*, as explained below.

Traversat and Sheard, individually or in combination, fail to show numerous features of

Claim 1

As stated in MPEP § 2143.03: “To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” In *Re Royka*, 180 USPQ 580.

Applicant admits to being perplexed about how to respond to the inconsistency between (1) the evidence required to support an obviousness rejection, and (2) the evidence that has been offered in the Office Action relating to the present application. Specifically, to support an obviousness rejection, the Applicant would expect an argument that has the following form: (1) element X is shown in reference A, (2) element Y is shown in reference B, and (3) there is some actual suggestion to combine the references A and B to create the mechanism or technique that has both elements X and Y.

However, the Office Action does not support the obviousness rejections in that manner. Rather, to support the obviousness rejections, not only has each claim been divided into its constituent elements, but also each constituent element of the claim has been finely dissected into a set of short phrases and sentence fragments. The Office Action then points out how each individual fragment corresponds to a similar fragment in any one of a handful of references. The fragment-to-prior-art correlation appears to have been made without any consideration as

to the relationship between the fragments, the meaning of the elements as a whole, and the meaning of the claim as a whole.

By way of example, consider a claim to “a device for blowing out one or more candles on a birthday cake in response to being presented the birthday cake.” By the Office Action’s logic, this claim may be rejected based on a combination of references discussing: (a) a hurricane – which shows “...blowing...,” (b) a 18th century Spanish Mission which was illuminated by a plurality of prayer candles on a candelabra – to show “...one or more candles on a...,” (c) a police report describing a car accident – to show “...in response to...” because the accident happened in response to two cars colliding, (d) the Wheel of Fortune® game show – because letters are “...presented...” to game contestants, (e) a recipe for a cherry sauce to accompany an Angel Food cake – which shows “...cake,” (f) an obituary of Grover Cleveland, the 22nd and 24th President of the United States of America – which includes a mention of the day of his birth to show “...birthday....,” and (g) a copy of Popular Mechanics magazine from March 1984, which discusses “a device for...” It is respectfully submitted that these references, either individually or in combination, do not render obvious “a device for blowing out one or more candles on a birthday cake in response to being presented with the birthday cake.”

In the same way, the nine cited references have been cited to show fragments of the claim elements, without any regard to the meaning ascribed to those claim fragments given their placement in the claims.

The Office Action acknowledges that *Traversat* “does not teach the sending of requests, the responding to requests, the writing of data to persistent storage, and the use of master processes.” However, despite this acknowledgement, and the fact that the approach of *Traversat* has nothing to do with transferring data from one cache to another cache, the Office Action relies upon various portions of *Traversat* to show fragments of various elements of

Claim 1. For example, *Traversat* is cited to show the fragments of (1) "...modifying the data item in a first node of said multiple caches..." at Col. 3, lines 49-51; Col. 6, lines 24-25; and Col. 10, lines 10-12, (2) "...to create a modified data item..." at Col. 10, lines 8-9 and Col. 3, lines 49-51, (3) "...sending the modified data item from said first node to a second node of said multiple caches..." at Col. 7, lines 61-63; Col. 3, lines 49-51; Col. 6, lines 24-25; and Col. 5, lines 17-19, (4) "...without durably storing the modified data item from said first node to persistent storage..." at Col. 9, lines 46-47; Col. 3, lines 49-51; Col. 6, lines 24-25; and Col. 5, lines 17-19, and "...after said modified data item has been sent from said first node to said second node..." at Col. 3, lines 49-51; Col. 7, lines 61-63; and Col. 6, lines 24-25.

However, no portion of *Traversat* shows, or is cited to show, the elements in Claim 1 of:

"sending the modified data item from said first node to a second node of said multiple caches without durably storing the modified data item from said first node to persistent storage;" or

"after said modified data item has been sent from said first node to said second node, said first node sending a request to a master of said data item for writing said data item to persistent storage;" or

"in response to said request, said master coordinating with said multiple caches to cause said data item to be written to persistent storage"

Thus, even though the cited art references may discuss certain words or phrases featured in Claim 1, the meaning ascribed to those words or phrases, given their placement in Claim 1, is not disclosed, taught, or suggested by the cited art. Further, as explained below, the cited art references often fail to show the words or phrases they are alleged to show.

As explained above, there are fundamental differences between the approach of Claim 1 and the approach of *Traversat*. For example, *Traversat* does not contain a suggestion of transferring data items from one cache to another cache. For example, the portion of *Traversat*

relied upon by the Office Action to show the claim fragment of “...modifying data items in a first node of a cache...” states, *in toto*:

It also discloses ways to manage user transactions that update or modify data in a data schema. For the purpose of illustrating one embodiment of the present invention, a Java system database (JSD) is examined...Area 303 represents the machine namespace having a machine node 305...At step 604 an event queue for the transaction is created when the transaction is instantiated or created. (Col. 3, lines 49-51; Col. 6, lines 24-25; and Col. 10, lines 10-12).

The cited portion of *Traversat*, instead of discussing modifying data items in a first node of a cache, merely discusses (a) modifying data within a database, (b) a machine namespace, and (c) creating a event queue. These topics have nothing to do with modifying data items within a cache. By the same token, since *Traversat* is absent any discussion of transferring data to or from a cache, the claim fragments of Claim 1 *Traversat* is relied upon to show that involve transferring data to or from a cache are not disclosed, taught, or suggested by *Traversat* in any way.

Similarly, *Sheard* is cited to show numerous other claim fragments of Claim 1, including the claim fragment of “...said master coordinating with said multiple caches...” Importantly, *Sheard* is not cited to show, nor does *Sheard* show, the claim elements of:

“after said modified data item has been sent from said first node to said second node, said first node sending a request to a master of said data item for writing said data item to persistent storage;” or

“in response to said request, said master coordinating with said multiple caches to cause said data item to be written to persistent storage”

Significantly, Claim 1 requires that after a modified data item has been sent from the first node to the second node, the first node sends a request to a master of the data item for writing the data item to persistent storage. Claim 1 also requires that in response to the first node sending a request to the master, the master coordinates with multiple caches to cache the data item to be

written to persistent storage. *Sheard* do not teach these steps, nor is *Sheard* relied upon to teach these steps.

Instead, *Sheard* is alleged to teach the use of a master as featured in Claim 1 by the teaching of an owner process, e.g., in Col. 68, lines, lines 48-52. Instead of teaching the above features of Claim 1, the cited portion of *Sheard* merely discusses the structure of a queue record, which *Sheard* describes may be used to store data in a queue. Such a structure is in no way analogous to the above-quoted elements of Claim 1.

Thus, neither *Traversat* nor *Sheard* individually teach each the following claim limitations:

“modifying the data item in a first node of said multiple caches to create a modified data item;
sending the modified data item from said first node to a second node of said multiple caches without durably storing the modified data item from said first node to persistent storage;
after said modified data item has been sent from said first node to said second node, said first node sending a request to a master of said data item for writing said data item to persistent storage; and
in response to said request, said master coordinating with said multiple caches to cause said data item to be written to persistent storage”

As a result of the numerous fundamental differences between (a) what *Traversat* teaches, (b) what *Sheard* teaches, and (c) what is featured in Claim 1, even if *Traversat* and *Sheard* were to be properly combined, the resulting combination would still not disclose, teach, or suggest numerous elements of Claim 1. Consequently, it is respectfully submitted that Claim 1 is patentable over the cited art, and is in condition for allowance.

Traversat and *Sheard* have not been properly combined

The Office Action states that it would have been obvious to:

combine *Sheard* with *Traversat* to send requests and respond to requests in order to standard processes [sic] to communicate between nodes in a computer system and gain acceptance of the system. Likewise, it would have been obvious to one of ordinary skill at the time of the invention to combine *Sheard* with *Traversat* to write data to persistent storage [sic] in order to retain the data when the system is shut down. Finally, it would have been obvious to one of ordinary skill at the time of the invention to combine *Sheard* with *Traversat* to use master processes in order to maintain control over key resources. *Traversat* and *Sheard* teach related applications. They teach the use of computers, the use of databases, the use of networks, the use of caches, the use of persistent storage, the use of applications, the use of nodes, the modification of data, the use of objects, the use of locks, and the use of messages.

However, notwithstanding the fact that neither *Traversat* nor *Sheard* disclose claim elements, the Applicant respectfully submits that there is nothing in either *Traversat* or *Sheard* that teaches or suggests combining their respective teachings.

As stated in the Federal Circuit decision *In re Dembiczak*, 50 USPQ.2d 1617 (Fed. Cir. 1999), (citing *Gore v. Garlock*, 220 USPQ 303, 313 (Fed. Cir. 1983)), “it is very easy to fall victim to the insidious effect of the hindsight syndrome where that which only the inventor taught is used against its teacher.” *Id.* The Federal Circuit stated in *Dembiczak* “that the best defense against subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or suggestion to combine prior art references.” *Id.* Thus, the Federal Circuit explains that a proper obviousness analysis requires “**particular factual findings** regarding the locus of the suggestion, teaching, or motivation to combine prior art references.” *Id.* (emphasis added).

In particular, the Federal Circuit states:

“We have noted that evidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved...although ‘the suggestion more often comes from the teachings of the pertinent references’...The range of sources available, however, does **not diminish the requirement for actual evidence**. That is, the **showing must be clear and particular**...Broad conclusory statements regarding the teaching of multiple references, standing alone, are not ‘evidence.’” *Id.* (emphasis added; internal citations omitted).

Neither *Traversat* or *Sheard* show any suggestion, teaching, or motivation to combine their teachings, nor does the Office Action provide a “clear and particular” showing of the suggestion, teaching, or motivation to combine their teachings. The only motivation provided in the Office Action is the hindsight observation that by combining features of those references, one may achieve the benefits achieved from the invention as described and claimed in the application.

Further, notwithstanding the fact that it is difficult to see how the approach of either *Traversat* or *Sheard* could augment the utility of the other, it is entirely unclear how the approaches may, in fact, be combined in the first place. For example, *Traversat* is directed towards a locking mechanism for a server maintaining a tree of nodes, while *Sheard* is directed towards an approach for exchanging data between two or more applications involving transforming a technology-dependent format of a data stream into a technology-independent format. Both of these approaches appear to be orthogonal concepts, and despite the Office Action’s unsupported assertions that the references may be combined, there is no explanation in any reference, including *Traversat* and *Sheard*, of how such a combination may be performed or what the resulting combination could possibly look like.

It is respectfully submitted that such a hindsight observation is not consistent with the Federal Circuit’s requirement for “particular factual findings.”

Consequently, for at least the above reasons, it is respectfully submitted that the rejection of Claim 1 under the improperly combined combination of *Traversat* and *Sheard* under 35 U.S.C. § 103(a) may not be maintained.

Claims 2-23 and 49-71 are patentable over the cited art

Independent Claim 49 recites features similar to that of Claim 1, except that Claim 49 is recited in computer-readable medium format. Consequently, it is respectfully submitted that, for at least the reasons given above with respect to Claim 1, Claim 49 is patentable over the cited art and is in condition for allowance.

Claims 2-23 and 50-71 are dependent claims, each of which depends (directly or indirectly) on one of the claims discussed above. Each of Claims 2-23 and 50-71 are therefore allowable for the reasons given above for the claim on which it depends. In addition, each of Claims 2-23 and 50-71 introduces one or more additional limitations that independently render it patentable. However, due to the fundamental differences already identified, to expedite the positive resolution of this case a separate discussion of those limitations is not included at this time, although the Applicants reserve the right to further point out the differences between the cited art and the novel features recited in the dependent claims.

CONCLUSION


For the reasons set forth above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any fee shortages or credit any overages to Deposit Account No. 50-1302.

Respectfully submitted,

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CERTIFICATE OF MAILING

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On April 19, 2005 By



Angelica Maloney